

WHAT IS CLAIMED IS:

1. A reagent for extraction of RNA comprising one or more of the following components:

- at least one non-ionic detergent;
- at least one ionic detergent;
- at least one chelator; and
- at least one reducing agent.

2. The reagent according to claim 1, further comprising an antibacterial agent (e. g., sodium azide, 0.5%)

3. The reagent according to claim 1, wherein the non-ionic detergent comprises a tert-octylphenoxy poly(oxyethylene) ethanol.

4. The reagent according to claim 1, wherein the ionic detergent comprises SDS.

5. The reagent according to claim 1, wherein the chelator comprises EDTA or EGTA.

6. The reagent according to claim 1, wherein the reducing agent comprises 2-mercaptoethanol or dithiothreitol.

7. The reagent according to claim 1 comprising:  
a tert-octylphenoxy poly(oxyethylene) ethanol;  
SDS;  
EDTA; and  
2-mercaptoethanol or dithiothreitol.

8. The reagent according to claim 1 comprising:  
at least one non-ionic detergent at a concentration of 0.1-4% by volume;  
at least one ionic detergent at a concentration of 0-1% by weight;  
at least one chelator at a concentration of 0.02-0.25 M; and  
at least one reducing agent at a concentration of 1-40% by volume.
9. The reagent according to claim 8 comprising:  
about 1% Igepal;  
about 100 mM EDTA;  
about 0.2% SDS;  
about 40% 2-mercaptoethanol; and  
about 0.5% sodium azide.
10. The reagent according to claim 8 comprising:  
about 1% Igepal;  
about 100 mM EDTA;  
about 0.02% SDS;  
about 20% 2-mercaptoethanol; and  
about 0.5% sodium azide.
11. A method for isolating RNA from plant material comprising one or more of the following:  
mixing the material with the extraction reagent according to claim 1 to form an extract;  
separating cellular debris from said extract to form a clarified fraction;  
organically extracting said clarified fraction to form an aqueous phase and an organic phase; and  
precipitating RNA from said aqueous phase.

12. The method according to claim 11, wherein the plant material comprises plant tissue, fungal mycelium or seed, said method further comprising pulverizing the tissue or seed to form a powder or paste.

13. The method according to claim 11, wherein the cellular debris is removed by centrifugation.

14. The method according to claim 11, wherein the organically extracting comprises chloroform extraction.

15. The method according to claim 11, wherein the precipitating comprises alcohol precipitation.

16. A method for isolating RNA from plant material comprising one or more of the following:

mixing the material with the extraction reagent according to claim 1 to form an extract;

separating cellular debris from said extract to form a clarified fraction; and

binding said RNA to a solid matrix.

17. The method according to claim 16, wherein said binding preferentially binds mRNA.

18. The method according to claim 16, further comprising eluting said RNA from said solid matrix.

19. A method for isolating RNA from plant material comprising:  
exposing a plant material comprising a plant tissue, fungal mycelium or seed to a permeabilizing reagent to permit cytoplasmic RNA to extract from cells or cell debris of said plant material; and  
separating said cytoplasmic RNA from said cells or cellular debris.

20. The method according to claim 18, wherein the separating includes filtering or straining.

21. The method according to claim 18, wherein the separating includes precipitating RNA and collecting the precipitate.

22. A kit for extracting RNA comprising one or more of the following components:  
one or more RNA extraction reagent according to claim 1;  
one or more RNase free wash reagents;  
one or more tissue filters; and  
one or more RNase free sample holding tube.

23. The kit according to claim 22, further comprising:  
components for organic extraction of said RNA.

24. The kit according to claim 22, further comprising:  
an RNase free matrix for binding RNA.